

REMARKS

Claims 1-10 and 13-21 are pending in the application.

The Applicants regret that the scheduled interview with the Examiner and the Examiner's Supervisor scheduled for mid July was cancelled and two calls to reschedule were not returned prior to today. The Applicants would like to thank the Examiner for discussing the case with the undersigned attorney today and agreeing to speak with the undersigned in a telephonic interview set for August 25, 2009 to discuss the case in an effort to expedite the allowance of the current application.

In the Office Action, Claims 1-10 and 13-20 have been rejected under 35 U.S.C. §103(a) as allegedly being obvious over United States Patent No. 4,034,023 to Hardy Sr. et al. (hereinafter referred to as "Hardy") in view of United States Patent No. 3,931,367 to Giolito (hereinafter referred to as "Giolito") and further in view of United States Patent No. 7,166,736 to Bright et al. (hereinafter referred to as "Bright").

In the section of the Office Action entitled "Determination of the scope and content of the prior art (M.P.E.P. §2141.01)", it appears that the Examiner has again misinterpreted Hardy. That is, the Examiner incorrectly stated that the Hardy reference teaches "reacting the first reaction product with excess n-butanol at a temperature 35°C to about 150°C," (see p. 3 of O.A.). Hardy does NOT state this temperature range for the reaction but instead clearly states that the first reaction product is reacted with excess n-butanol at a temperature below 35°C in order to prepare a crude mixed phosphate ester composition comprising tributyl phosphate, dibutyl phenylphosphate and butyl diphenyl phosphate.

Hardy is very clear, the reaction of the first reaction product with excess n-butanol is kept below 35°C in order to reduce the amount of by-products in the reaction and the higher temperatures (namely 50°C -150°C) is used only after the reaction is completed in order to purify the crude mixture using standard distillation. In fact, Hardy clearly states that the reactants be "reacted in the cold, that is at a temperature below 35°C, during the entire reaction to prevent product loss due to acid hydrolysis." (Hardy, Col.3, lines 6-9, emphasis added). Immediately following this section, Hardy then states the preferred reaction temperature as "15°C to 20°C . . . and maintained at about 20°C to 30°C until the reaction is complete." Notably, the only place in Hardy where the temperature range of "50°C to 150°C" is recited is in the purification and drying of the product, *which occurs after the "reaction is complete."* (Hardy, Col.3, lines 34-66). Accordingly, Hardy fails to teach or suggest the claimed invention. For this reason alone the rejection should be reconsidered and withdrawn.

In addition, it appears what the Examiner has done is improperly string the upper temperature limit of 35°C for the reaction and the upper temperature limit of the range used in the standard purification step of distillation after the reaction is completed to arrive at the improper temperature range.

This interpretation is improper for at least two reasons. First, stringing the two different temperature ranges for the two different stages of the process (i.e. the temperature range of the reaction and the temperature range of the purification of the crude product of the reaction when the reaction is completed) fails to take into account the reason why Hardy avoids temperatures above 35°C when conducting the reaction. Secondly, stringing a range with an upper limit of

35°C with a purification step having a temperature range of 50°C to 150°C does not result in an overall range of 35°C to 150°C since the range between 35°C and 50°C is not even disclosed in Hardy. For these additional reasons the rejection must be reconsidered and withdrawn.

Moreover, in stark contrast, the process of the present invention, as claimed, is conducted at a temperature above 35°C, namely 60 to 200°C. As stated above, Hardy, which requires that the reaction be conducted at a temperature below 35°C, specifically teaches away from using a temperature above 35°C during the entire reaction to prevent product loss due to acid hydrolysis. Neither, Giolito nor Bright corrects the factual deficiencies of Hardy. Indeed, even if Hardy is combined with Giolito and Bright, the claimed invention would not be obtained, as it would not result in a process that is conducted at a temperature above 35°C, let alone 60 to 200°.

It is respectfully submitted that it is critical to the present invention that the process is conducted at a temperature above 35°C. Indeed, it has been unexpectedly found that the reaction of dichloromonophenyl phosphate and monochlorodiphenyl phosphate with an aliphatic alcohol, in the presence of a Lewis acid catalyst, in the absence of solvent, at a temperature of above 60 to 200°C, and at a pressure of 0.001 to 1.1 bar absolute pressure (bara) produces a product having a higher purity than would have been expected. That is, as shown in the application, particularly, in Table 1, example 3 conducted at a temperature of 120°C and at 150 mm Hg and example 4 conducted at a temperature is 120°C and at 50 mm Hg have a calculated reaction yield (upon adding TTP, 2-ethylhexyldiphenyl phosphate and 2-

ethylhexylphenyl phosphate) of 94.4% and 97.4% respectively. In stark contrast, the reaction process recited in Hardy conducted at a temperature below 35°C, so as to avoid by-product, has a yield of 77% and 82% (when 2 molar excess of alcohol is used). Therefore, conducting the claimed process at a temperature of 60 to 200°C unexpectedly produces a more purified product mixture.

Even though it is not necessary to show criticality since the reaction temperature of 60°C to 200°C of the present invention is neither taught nor suggested by Hardy alone or in combination with the two secondary references and the references teach away from doing what the Applicants done, the following section is reiterated from the previous response in order to further support the Applicants position.

In order to identify the criticality of conducting the process of the present invention at a temperature above 35°C, the Applicants provided a Declaration of Andrew M. Piotrowski in the previous response, a Scientist for the assignee of the priority patent and the present application, which includes "a side-by-side comparison of the product yield of the process of the present invention and that of the prior art at the same reaction temperature and concentration" as requested by the Examiner. Indeed, the Examiner has acknowledged Applicants' argument in a previous Office Action and requested a showing of unexpected results. The side-by-side comparison of the product yield of the claimed process and that of the prior art process at the same reaction temperature and concentration provided in the affidavit previously submitted clearly demonstrates the unexpected results. The full discussion of the side-by

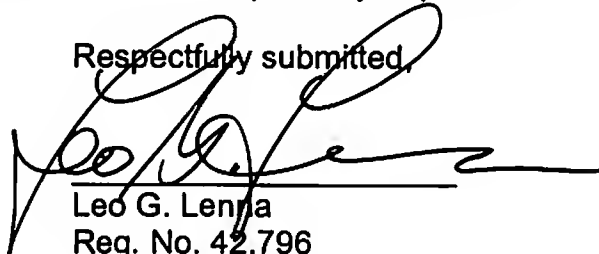
side analysis of the affidavit in the previous response is incorporated herein in its entirety. As shown in the side-by-side comparison of the process run under the Hardy conditions (experiments 1 and 2) and the process run according to the claimed conditions (experiment 3), the temperature used is shown to be critical in producing the claimed process wherein the yield is higher and is done without excess alcohol.

Accordingly, carrying out the reaction under the conditions of the present invention unexpectedly produces a more purified product mixture than the temperature range recited in Hardy for the reaction. In addition, Hardy in view of Giolito and in further view of Bright neither teaches nor suggests the process as claimed. Accordingly, the rejection of Claims 1-10 and 14-20 under 35 U.S.C. §103(a) must reconsidered and withdrawn.

In view of the foregoing remarks, it is respectfully submitted all claims pending herein are in condition for allowance. As stated above, the undersigned attorney looks forward to discussing the allowability of these claims in the telephone conference set for August 25, 2009 at 9:00 AM.

Early and favorable consideration of the case is respectfully requested.

Respectfully submitted,



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